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BROWN PATCH OF LAWNS AND GOLF GREENS AND ITS CONTROL

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Large and small brown patch are diseases of grass caused by the fungi *Rhizoctonia solani* Kuhn and *Rhizoctonia* sp., respectively. These diseases have undoubtedly occurred throughout the United States for many years; they are very common in Florida. They have appeared in Florida, usually during the early summer, although they have been found in the southern part of the State during other seasons of the year. The complete host range of these fungi has not been determined. However, since they kill St. Augustine and Bermuda grass they are of considerable importance because these grasses are planted in a large percentage of the lawns in the state. Golf greens are usually planted to various types of finer-leaved grasses, especially the bents and fescues, which are very susceptible to brown patch. Excessive rainfall, heavy dews, fog, cloudy weather, high humidity and high temperatures are the principal factors favoring the appearance of these diseases.

The characteristic symptom of the disease is the death of the grass in circular areas. The first indication of the trouble may be the appearance of an area in the lawn which appears scalded during the middle of the day. This area may enlarge for several days, if the humidity is high, or it may cease to grow and others may appear in different places at the same or at different times. Occasionally these patches are so numerous that they join each other, resulting in very serious damage to the lawn which may necessitate resodding.

Golf greens often become badly scarred through the ravages of these diseases, and greens keepers should be constantly on the alert, especially when conditions are favorable for their development, so they can be detected and treated early. There are several causes for brown patch-like areas appearing in various sods, the most common of which is burning by haphazard methods of applying fertilizers. This type of damage is most commonly observed on golf courses tended by inexperienced greens keepers and on private lawns. This trouble can be avoided and is inexcusable.

In the early morning before the dew has disappeared the parasites which cause the disease may be seen in the form of whitish spiderweb-like growths among the grass blades. This fungous growth penetrates the surface of the grass blades, invades the tissue, and kills them rapidly. This growth cannot be seen after the dew disappears except by careful examination. During the night, or period of high humidity, the fungus may continue its development and again be evident. During the period of growth the fungus forms numerous small bodies known as sclerotia which are about an eighth of an inch in diameter, tan to dark brown in color, spongy at first but later becoming hard. They are formed on the side of a leaf blade or stem and when mature drop off on the ground. These structures function somewhat the same as seeds of flowering plants. They remain alive for indefinite periods and when favorable conditions for growth surround them, they produce new fungous threads that are capable of infecting grass plants and causing brown patch. These sclerotia are exceedingly resistant to unfavorable conditions, such as cold and dryness, and will withstand applications of various fungicides that are applied in concentrations sufficiently dilute to be unharmful to grass.

DESCRIPTION OF THE DISEASE

There are two kinds of brown patch which are differentiated primarily by the size of the affected area. They are designated by the terms "large" and "small" brown patch. The large brown patch is probably the most common on St. Augustine and Bermuda grass in lawns, while the small brown patch is more common on golf greens. The large brown patch appears first as a smoky-brown discoloration changing to brown. Its appearance is often as of "overnight", and it may cover areas several feet in diameter. In the morning before the dew has disappeared, the web-like fungous strands may be seen around the edge of the affected area. This web-growth becomes inconspicuous when the moisture disappears and the grass becomes brown, shrivels and dies. Usually all of the grass blades within an area are killed more or less, except when conditions are not entirely favorable for the fungus. In such circumstances numerous blades may escape unharmed. The stems and runners are not killed, except in severe cases, which permits rapid recovery and natural disappearance of the spot.

Small brown patch is somewhat similar to large brown patch, except that the spots are relatively small, being 2 to 4 inches in diameter. These spots appear quickly as do those formed by large brown patch. Very few blades of grass within the spot escape the fungus, however, and the spots appear somewhat of a lighter brown color. This, however, may vary considerably. This disease is more common on the fine grasses of greens and some lawns and is not common on the coarser grasses. When the spots are small, the two types of disease are often confused.

CONTROL

Golf greens should be constructed so they will have adequate air and water drainage. The former is an important aid in relation to temperature and duration of heavy dews. Where drainage is lacking, the fungi causing brown patch have longer periods under favorable conditions in which to develop and kill the grass. Trees should not be permitted to grow close enough to the greens to shade them during the morning hours. Watering should be done in the morning rather than in the evening, since long contiued moisture favors the development of the disease. These percautions do not apply entirely to lawns, since there is often no choice.

Mower clippings should be removed when the grass is cut and reapplied when composted.

The use of fungicides is to be recommended for brown patch in both lawns and greens. Bordeaux mixture 4-4-50 is the best copper fungicide and should be applied to the grass when the first sign of brown patch appears or, even before the disease appears, when dews are heavy, weather is warm and humidity is high. This spray is effective in controlling large brown patch, which is more common in Florida on the coarser grasses in lawns. However, Montieth recommends the use of organic and inorganic mercury in different forms for the control of brown patch, in either lawns or greens. The method for the control of small brown patch consists of the application of calomel (mercurous chloride) to the affected areas according to the following formula.

Small brown patch:—3 ounces calomel (powdered)
6-8 quarts dry sand.

Mix thoroughly and apply to 1,000 square feet of turf and then water thoroughly so as to remove the fungicide from the grass blades and wash it into the soil.

A slightly different formula is recommended for large brown patch.

Large brown patch:—1 ounce mercury bichloride
2 ounces calomel (mercurous chloride)
6-8 quarts of dry sand.

Mix thoroughly and apply to 1,000 square feet of turf; and then water as described above. If the weather is hot and humid, use only 6 quarts of dry sand.

For further information and identification of diseased specimens, inquire of the Agricultural Experiment Station.